

MEDICAL EXAMINER.

DEVOTED TO MEDICINE, SURGERY, AND THE COLLATERAL SCIENCES.

No. 32.] PHILADELPHIA, SATURDAY, AUGUST 8, 1840. [Vol. III.

BIBLIOGRAPHICAL NOTICE.

Recherches sur l'Introduction Accidentelle de l'Air dans les Veines, &c. Par J. Z. AMUSSAT. Paris, 1839.

Researches on the Accidental Introduction of Air into the Veins; and especially on the Question, "Can air introduced spontaneously by a wounded vein during a surgical operation cause death suddenly?" By J. Z. AMUSSAT. Paris, 1839. 8vo. pp. 250.

THE subject of M. Amussat's monograph has for some years past been exciting considerable and increasing interest. In the early part of the present century, the alarming effects produced by the accidental introduction of air into the jugular vein of a horse, during the operation of bleeding, at the veterinary school of Alfort, directed attention to the question comprehended in the title of M. Amussat's work. Subsequently, the occurrence of well marked and fatal accidents, from analogous causes in the human subject, arrested the special notice of surgeons and physiologists, among them M. Magendie, from whom it elicited the publication of a lecture on the subject, as well as M. Amussat, who made some researches, submitted to the Academy in 1835, in a Memoir on Traumatic Hæmorrhages. M. Amussat has since followed up the subject in the treatise lately published, in which he collects all the facts known on the subject, and discusses them in a calm, impartial, and elaborate style. We are indebted to the July number of the Edinburgh Medical and Surgical Journal, for a very complete notice of M. Amussat's work, from which we condense a tolerably full summary of the leading facts and important conclusions.

The cases recorded by M. Amussat are thirty-nine in number, which may be classified in the following manner:—

"The whole thirty-nine facts naturally arrange themselves in five distinct classes or categories. The first category consists of ten facts, which may be called incontestible, in so far as their correctness receives confirmation from the evidence of dissection. The second category contains six facts analogous to the

preceding, but without the evidence of dissection. The third contains fourteen instances of air admitted into the veins, twelve in man and two in animals, and in which recovery took place. The fourth division contains seven doubtful facts. And the fifth contains two instances of suicide produced by wound in the neck, and in which there was strong reason to believe death had been the result of the ingress of air into the veins.

"Viewed in the relation of the diseases and operations, these 39 cases resolve themselves into the following divisions.

"1. Nine instances of tumour of the neck; 2. seven instances of operation on the shoulder or the arm-pit; viz. two cases of tumour of the right shoulder; three cases of extirpation of the arm; and two tumours of the axillary region; 3. six cases of tumour of the breast; 4. two cases of ligature of the subclavian artery; 5. four cases of tumour of the face; 6. five instances of blood-letting from the jugular vein, two in man, and three in the horse; 7. four cases of wounds of the jugular vein, (suicidal;) and 8. two cases without positive indication of the nature of the operation.

"Considering the cases as to the veins by which the air has been introduced, the following are the results.

"1. By wound of the external jugular vein, the phenomenon took place four times; 2. by the external jugular vein, twelve times; four times by blood-letting in the neck; 3. by the veins of the neck canalized, that is rendered open continuous canals, four times; (see pages 208 and 210;) 4. by the subclavian vein, once; 5. by the axillary vein, three times; 6. by the subscapular vein, twice; 7. by a vein opening into the subclavian, once; 8. by the pectoral veins, three times; 9. by the facial vein once; and, 10. six or eight times, the veins opened have not been specified.

"As to the duration and the stage of the operations, death took place eight times at the close of long and laborious operations, which weakened the patients by hemorrhagy and nervous exhaustion; and especially at the termination of the operation, at the moment when the tumour is removed.

"Twice, however, death took place in consequence of the accident occurring at the commencement of the operation. Death, it must be further remarked, is more prompt when the patients are most enfeebled, as was seen in the cases which occurred to M. Delpech, M. Castara, and M. Roux.

"As to the duration of the accident, we find that, among sixteen deaths, the authors of the

cases say, eight in nine times, that death took place suddenly, without specifying the actual duration.

"In one case (Ulrich,) death took place one minute after the accident; in one case (Beauchene,) forty-five minutes after; in one case (Clemot,) some hours after; in one case (Mirault,) three hours and a half after; in one case (Roux,) seven days after the accident.

"In many cases of recovery it is almost always at the commencement of the operation that the accident has occurred. In the case recorded by M. Amussat himself, however, the accident took place at the end of a long and laborious operation. In this case, however, he observes little air entered, because the vessel was small, and the opening was promptly closed.

"There is, however, a very obvious reason for the accident occurring more commonly at the close of an operation than at its commencement. It is then chiefly that the deep-seated vessels are divided; it is then, above all, that those vessels are most usually divided, which are most directly connected with the veins of the chest.

"M. Amussat remarks as to sex and age, that the cases give seventeen men from 21 to 60 years; seventeen females from 18 to 68; two cases in which the age and sex are not specified; and three horses. It must be observed on this head, that it is not very philosophical to trace any connection in this inquiry between the ages of the patients, or even the sex, and the accident. It is quite clear, that it is the primary disorder that ought, in such circumstances to be kept in view. Tumours of the neck or shoulder requiring operation may occur at any age. Most of the cases of tumours of the neck were examples of encephaloma; those of the shoulder were either of that nature, or *osteo-sarcoma*; and the tumours in the breast and axilla appear to have been scirrhus or carcinoma.

"In those circumstances it is almost superfluous for M. Amussat to say, that it is interesting to observe, that the phenomenon has not been observed in children, and to add, that the reason is perhaps because at that age there is less frequent occasion to perform operations in the dangerous region.

"II. Though the collection of facts already adduced may be regarded as competent to establish the truth of the general inference, that air may, in certain circumstances, be introduced into the veins of the animal body, and that, when introduced, it speedily gives rise to most pernicious and commonly mortal effects, yet there are various other points which require either confirmation or some elucidation. Of this kind are the questions, which are the circumstances favourable or unfavourable to the introduction of air into the venous system? why is air inspired or drawn into the veins of one part of the body and not into those of

another? and are there any known means by which this accident may be prevented, or if it take place, its pernicious effects may be counteracted? To throw some light on, if not to determine these questions, is the great object of the experimental inquiry undertaken by M. Amussat.

"M. Amussat divides his inquiry into three chapters; the first relating to the spontaneous introduction of air into the veins; the second relating to the forced or artificial introduction of air into the venous system; and the third devoted to the examination of the means of preventing or arresting the accident, or counteracting its effects.

"A. M. Amussat observes, in the first place, in reference to the spontaneous introduction of air into the veins, that his researches show that air cannot be introduced spontaneously into all veins. These researches show that this phenomenon can take place in the normal state only in those veins in which there is a reflux of blood, or what is designated by the name of the venous pulse (*pulsus venosus*.) On this subject Haller may be consulted, lib. vi. sect. iv. It is sufficient to say, that these veins are all those which are situated at the anterior part of the neck, at the upper part of the chest, and in the arm pit. The space in which these accidents are likely to take place, and to which he applies the name of *dangerous*, may be circumscribed by two semi-elliptical lines, going from one arm-pit to the other, the one above the collar-bones, the other below them. But if the veins be supposed to be canalized or converted into cylindrical tubes like the arteries, the phenomenon might take place over a much larger extent.

"The experiments performed by M. Amussat are of three orders. In the first are placed all those experiments which relate to the spontaneous introduction of air into the veins of animals in the normal state. In the second are placed all those experiments which demonstrate the influence of the abstraction of a certain quantity of blood before the production of the spontaneous phenomenon. And in the third division, he proposes to prove that, by converting the veins into uncollapsing canals, the spontaneous phenomenon may be produced at a much greater distance from the heart, than is observed in the normal state.

"These experiments were performed on rabbits, dogs, sheep, and horses, by exposing one or other jugular vein, or the axillary vein, and thus allowing the air to enter without any additional contrivance. In the second series of experiments, quantities of blood, varying from a few ounces to some pounds, according to the size of the animal, were previously withdrawn. In the third series of experiments, M. Amussat introduced a caoutchouc tube into the interior of the veins, and in this manner rendered these tissues inflexible or incapable of collapsing. Our limits do not allow us to

detail these experiments; but we give the results obtained in each order of cases.

"Of the first series of experiments, the following summary gives the general results.

"It may be regarded as established, that the spontaneous introduction of air by a vein wounded near the apex of the chest, in animals of different sizes, produces almost always death in a manner more or less sudden.

"Among twenty-six animals subjected to this experiment 24 died, 2 resisted. The rabbits died in the course of from one minute and a half, to 2, 3, or 5 minutes. The dogs died in the course of one minute, 3, 6, 10, 16, 24, and 27 minutes. Two survived. The sheep died in the course of from 19 to 56 minutes. The horses died in the course of 14, 15, 17, 26, 28, 35 minutes, 1 hour and 44 minutes, 1 hour and 50 minutes, and 2 hours and 30 minutes. One animal alone resisted, because, having fallen with the neck supported against a tree, there was formed a clot which plugged up the opening in the vein. But when the clot was removed, he died in 26 minutes afterwards.

"As a general rule, the duration of each experiment is included between the moment of the introduction of the air and death. As soon as the eyelids begin to flutter, when a finger is placed on the animal's eye, it is understood that life has then ceased.

"In almost all these experiments the right cavities of the heart alone contained frothy blood. The lungs were sound. The veins of the brain contained seldom some bells of air.

"B. Of the second series of experiments, the following summary gives the results.

"It appeared clearly that depletion, by withdrawing a certain quantity of blood from the vessels, has considerable influence on the promptitude with which the effects of the spontaneous introduction of air takes place. Among 16 animals subjected to this kind of experiment, 14 died; one alone, a dog, resisted its effects. In another dog some bells of air were allowed to enter; and he was destroyed in order to ascertain whether the air had been admitted. The dogs died in the course of 1, 4, 6, and 25 minutes; the sheep after 7 and 16 minutes; the horses after 3 minutes and a half, 9, 12, 13, 16, and 23 minutes.

"In some cases, as in the second experiment, on the horse, the phenomena approach with as great rapidity as in the case of the forced and sudden insufflation. The symptoms are the same; death is as speedy; and, on inspection, air is also found in the left cavities. This difference can be explained only by the facility with which the air passes through the vessels, suddenly emptied. Death takes place doubtless more speedily, because the three principal organs are injured by the presence of air in the vessels.

"To conclude, it may be said that the spontaneous introduction of air by a wounded vein, determines death so much more quickly, as the

animal has lost a greater quantity of blood, or as he has been exhausted by pain. It is doubtful whether debility from any other cause can produce the same result. It might appear at first sight, that debility from fatigue, old age, or disease, ought to be equivalent in influence to the abstraction of a certain quantity of blood. But the experiments upon horses, most of which were diseased, prove that it is not those which are most feeble in appearance that resist the least. A horse that could scarcely stand from absolute debility, survived the commencement of the experiment 16 minutes.

"C. The third series of experiments shows that if a tube be introduced into a vein beyond the point of reflux of the blood, or, in other words, beyond the dangerous region, and carried into the dangerous region through the vein, air may be in this manner also introduced into the superior cava and heart, and the usual effects will follow. It appears, in short, from these experiments, that, if a wounded vein be dilated and kept open like an artery by an organic disease, the phenomenon of the spontaneous introduction of air is almost as much to be dreaded, as if the vein were wounded within the limits of the venous pulse.

"In the second chapter, M. Amussat details the experiments on the forced or artificial introduction of air into the veins. Air may be introduced into veins in this mode, either suddenly or slowly. In the first case it almost uniformly produces speedy and irrecoverable death, as is well known by the experiments of Nysten. The results of the experiments performed by M. Amussat may be stated in the following manner.

"Among 18 animals subjected to this sort of experiment, 15 died. Rabbits died in the course of from 50 seconds to 1 minute; dogs in the course of 2 minutes; sheep in from 1 to 2 minutes; and horses in the course of 3, 5, 6, 6½, 13, and 16 minutes. Three dogs resisted the experiment, which was performed by injecting air with a syringe.

"The symptoms observed are nearly the same in all. Whatever be the animal, death is instantaneous. He falls as if struck by lightning, or stunned by the blow of a mace. Scarcely is there time to observe what passes between the instant of the forced introduction of air and death.

"Sometimes, however, the animals resist longer, 16 minutes, for instance, as seen in the last experiments upon the horses. But in these cases the insufflation had been made gently, and by a person whose lungs were of small capacity.

Another source of difference in results may also be the circumstance, that in some cases it was deemed unnecessary to tie the veins on the tube employed for insufflation; and when this is neglected, it may happen that the air returns between the *parietes* of the vein and the tube.

"In all cases the heart is distended with frothy blood; and the venous and arterial vessels are more or less filled with air.

"Death takes place evidently from the interruption of the circulation. The air distends the right chambers of the heart, and prevents the venous blood from reaching them.

"When the air is introduced forcibly but slowly, the phenomena are quite the same; but the result is longer in taking place, and death consequently is slower in approaching. This depends on the gradual introduction of air, because then the harmony of the functions of respiration and circulation is not suddenly destroyed. In general, a larger quantity of air is required to produce the effect, when it is impelled gently into the venous system; and in some instances, it does not in this mode produce the fatal termination.

"On comparing these last results with those of the first series, that is, those of the spontaneous introduction of air into the veins, it is seen that there is a great analogy between the phenomena which ensue when air is impelled gently, and when it is introduced spontaneously. The symptoms are the same; and the animals die nearly in the same space of time.

"There is nevertheless this remarkable difference, that after death produced by the spontaneous introduction of air, in general the right chambers only of the heart are distended with air, whereas, after its forcible introduction, air is found in the left chambers as well in the arteries as the veins.

"The difference in the rate of rapidity with which death takes place, may be explained by saying, that, in the forcible introduction of air, the functions of the heart, of the lungs, and of the brain are disturbed, while in the case of slow or spontaneous introduction, the disturbance is confined to the two first organs.

"D. These experiments, and the results obtained by them, lead naturally to the third object of inquiry, namely, to ascertain whether we possess any means of preventing or arresting this formidable accident, or, after it takes place, of counteracting its effects. Though the experiments undertaken with the first two objects are calculated to throw some light on this question, M. Amussat has devoted to its express elucidation ten experiments; and the results of these may be stated in the following manner.

"It appears, that it is not possible to prevent the occurrence of this accident by previously compressing the chest and belly, as has been imagined. The only compression which is efficacious is that which is applied directly over the vein, or the principal venous trunk; and the best means of remedying as much as possible the accident, is to close quickly the aperture by which the air has obtained admission. By observing this precaution, the continuance of the phenomenon is prevented, and the animal may survive, if too much air has

not been introduced. The same result sometimes takes place when a clot is formed in the aperture.

"When much air has obtained admission, and the animal resists its effects, if frothy blood escapes at each expiration, it is a favourable symptom; for if the opening be closed, the animal, which might have lived, dies speedily.

"M. Amussat concludes, therefore, that the experiments detailed in the present essay lead naturally to the use of the means which he has specified, and which consist in stopping at first the aperture, or causing the patient to make quickly motions of inspiration, and in favouring this time of respiration by compressing the chest and belly, in order to expel the air introduced.

"There is, however, in this statement a singular inconsistency, which may lead to an important and serious practical error. M. Amussat says, that the means of arresting the accident consist in first stopping the aperture, and causing the patient to perform motions of expiration. Now, to any one who knows anything either of this accident, or of the influence of respiration on its occurrence, it must appear absurd and impracticable to speak of *closing* the aperture, and causing the patient to make efforts of *expiration*. If efforts of expiration be made while the aperture is closed, not the slightest benefit will result; and if it be wished to prevent the accident from going further, the aperture should be open, while the patient makes efforts of expiration. It is during *inspiration* that the aperture ought to be closed, because it is during inspiration that the air is liable to be drawn in by a vein situate within the influence of the function of respiration. There is no risk of air being drawn in during *expiration*, but some risk lest it may not be expelled if already admitted. The rule, therefore, ought to be, instead of first closing the aperture, and directing the patient to make efforts of expiration, to close the aperture the moment the hissing sound is heard, and keep it closed during *inspiration*; but if air have been admitted, to open it during *expiration*, in order to favour the escape of air, which always comes away in the form of frothy blood. It must be observed, nevertheless, that, unless this can be done with perfect accuracy, the best and safest course is to keep the aperture constantly shut, as the slightest mistake in opening the aperture during *inspiration* instead of *expiration*, may, by giving admission to a large quantity of air, prove instantly fatal. When it is kept closed, there is no chance of further admission to air; and if that already admitted be not very great, it is absorbed, and the circulation is re-established. This result, there is good reason to believe, took place in those instances of recovery in which air had obtained admission into the venous system.

"M. Amussat further thinks, that the best

means of counteracting the effects of the accidental admission of air into the venous system consists in pumping out the air introduced into the heart; and that it is requisite to introduce promptly a tube, in order to make aspiration, that is, exhaustion of the air, as it passes rapidly into the ventricle, and even into the vascular system. This practice may be successful; but we cannot help looking upon it as exceedingly dangerous, and likely to be detrimental. The chance of extracting air in this manner is small and precarious; and, unless the utmost care be taken, air is as likely to be admitted as extracted. M. Amussat himself allows that the animal sometimes dies, before there is time to operate, when all the preparations are previously made.

"The general result of the whole of the experimental researches detailed in this part of his work, M. Amussat comprehends in the following fifteen aphorisms, which we annex as presenting a condensed view of the conclusions of the whole matter.

"1. The spontaneous introduction of air by an opening made in a vein in the neighbourhood of the lower part of the neck, and upper part of the chest, where the reflux of the venous blood is observed, is a constant phenomenon.

"2. Air introduced in this manner produces almost always a peculiar sound, which cannot be mistaken, when once heard, and which it is difficult to confound with any other noise, because it has peculiar characters.

"3. The intensity of the phenomenon is in proportion to the aperture in the vein, its size, the vicinity to the heart, and especially the force of inspiration.

"4. The danger of the introduction of air into the veins is greater in proportion to the quantity of blood lost by the animal.

"5. Death is so much the more speedy, in proportion as the animal has suffered long.

"6. On opening the chest of animals dead suddenly by the spontaneous introduction of air into the veins, the right chambers of the heart are found constantly distended, inflated with air, more or less mixed with blood, while the left chambers are almost always empty, collapsed, and contain little or no air.

"7. The cause of death appears especially to be attributable to the interruption of the pulmonary circulation.

"8. The vertical position often favours the introduction of air, because the animal is agitated, and makes great inspirations.

"9. The phenomenon may take place beyond its legitimate limits, fixed by the reflux of the blood, by canalizing the vein by means of a tube.

"10. The sudden and forcible introduction of air into the veins produces almost invariably instant death, in animals very different in species and size.

"11. The previous compression of the chest and of the abdomen does not prevent the oc-

currence of the spontaneous introduction of air.

"12. The aspiration of air by a wounded vein is produced altogether by the thoracic walls, and in no degree either by the heart or lungs.

"13. Air escapes during expiration in all the positions in which an animal is placed; but in the standing attitude, the blood remains in the wound, is there coagulated, and plugs up the aperture.

"14. Compression of the chest and belly after expiration favours the issue of the air, and by repeating this manœuvre several times the heart is aided in ridding itself of the air which distends its right chambers.

"15. Lastly, aspiration by a glass tube and syringe shows that more blood than air is withdrawn; but the blood may be repelled, retaining the air, and the operation may be resumed, so as to aspire almost all the air contained in the right chambers of the heart.

"Upon these aphorisms, we have nothing to observe, further than what has been already said on the stoppage of the wound during inspiration, and the probable dangerous effects of attempting aspiration.

"III. In the third part of his essay, M. Amussat undertakes to give an explanation of the phenomenon of the spontaneous introduction of air into the veins.

He first proceeds to answer any objection that might be urged against the fact of the presence of air in the right chambers of the heart, by showing that air, in such circumstances, could not proceed from decomposition, or be introduced by incautious opening of the cavities. It is always possible to distinguish between air generated under such circumstances and that introduced accidentally, by the presence of other marks of decomposition, and by the circumstance of air being found in other cavities and parts of the body. In this accident, on the other hand, the right chambers only are distended with air mixed with blood; the blood also is frothy, if the body be examined immediately or soon after the accident; and the left chambers are almost always empty. It is impossible, therefore, to confound the appearances with cadaveric effects.

"Another proof which shows that it is impossible to confound the circumstances and effects of the accidental introduction of air into the veins during life with cadaveric appearances, even with the presence of a large quantity of air in the heart, is obtained from performing on a dead body the following experiment. If, after opening one of the jugular or the subclavian veins very near the chest, alternate pressure be made on the walls of this cavity, in order to imitate respiration, then air obtains admission, because the chest performs the function of a sucking pump. If the chest and pericardium be opened carefully, the right chambers are found distended and inflated with air, and the left chambers are in their usual

state. Upon opening the right chambers air escapes in a body, and they collapse. On opening the left chambers, nothing of the kind is observed. In this case the right chambers are distended with air, but the air is not mixed with blood. The blood is not frothy; an essential character which establishes a difference between air introduced during life and air introduced after death.

"The knowledge of these facts is of importance in a medico-legal point of view.

"From all the facts described by the experiments now mentioned, it results almost inevitably, that the introduction of air into a wounded vein near the upper part of the chest is a physical and almost purely mechanical phenomenon. It is a mechanical effect of the action of bellows, produced by the external pressure of the air on the right chambers of the heart. The alternate motion of the chest determines the entrance of the air; and it does so by acting on veins which are not, by their position, allowed to collapse. The adherence of the venous parietes to their cellular sheaths, where they form canals, and where these sheaths adhere to bones, as in the case of the subclavian veins, and the reflux of the blood by the motion of respiration, are the two causes which determine the admission of air into the wounded veins near the upper part of the chest.

"He very properly remarks, that the action of the auricle, which in propelling the blood produces an oscillation in that column which regurgitates in the *venæ cavæ*, performs no part in the introduction of air into the veins, in which the venous pulse is observed.

"It is known that this name is applied to the reflux of blood which is observed in the jugular and subclavian vein during expiration, and which depends on the temporary impediment given to the progress of the blood in the *venæ cavæ* at the moment at which expiration takes place, and the lungs sink, and the blood of the pulmonary artery is consequently prevented from continuing its progress. This reflux motion or mere stationary condition of blood during inspiration is very distinct in the jugular veins of emaciated persons, when the breathing is difficult or embarrassed, in disease of the heart, and in persons in the last agonies.

"The phenomena of the venous pulse or the reflux of blood may be easily observed in animals. It is distinctly seen in the jugular and subclavian veins, at some distance from the chest, in the swelling of these vessels. In great motions of expiration, the reflux ascends to some height, when the circulating currents are unimpeded; but when the blood is prevented from moving, the reflux ascends only one or two inches above the first rib.

"M. Amussat further thinks that this reflux is particularly produced by the compression of the right auricle, and of the *venæ cavæ*, by the lung during the motion of expiration. This cause we must regard as very doubtful in its

operation. The lung may compress the auricle and the *venæ cavæ*; but would this compression produce the effect? The cause which appears to us much more efficient is that already assigned, namely, the temporary but sudden stop which the blood of the pulmonary artery encounters during expiration and the collapse of the lung, and which has the effect of interrupting the progress of the blood through the ventricle, auricle, and *venæ cavæ* at once.

"Before quitting this part of the subject, it is requisite to notice that a different hypothesis, both as to the cause of the introduction of the air, and as to the mode in which its presence produces death, has been recently propounded by Sir Charles Bell.

"The admission of air, Sir Charles ascribes, in the first instance, to the elevation of the muscles of the neck, by which the atmospheric pressure is taken off, and the air is drawn into the open vein. This, he conceives, is proved by the fact, that if in the dead subject an incision be made in the lower part of the neck, the external jugular vein is found flat or collapsed; but if an incision be made on raising the shoulder and collar-bone of that side, the vein opens; and if any fluid be poured into the hollow space of the neck, and the motions of respiration be imitated by alternately raising and depressing the shoulder and collar-bone, the fluid gradually descends into the vein.

"It is probable that the elevation of the shoulder and clavicle does take off pressure from the vein; but it seems also impossible to doubt that it has the effect of opening the vein and thereby canalizing it.

"From observing the very rapid manner in which death takes place in consequence of this accident, Sir Charles infers that it is the effect of the air entering the vertebral arteries, thus depriving the *medulla oblongata* of blood, and immediately thereby extinguishing in its source, all motion, voice, and expression. A doctrine very similar had been previously taught, first, by Bichat in a general manner, regarding the brain being the organ first affected, and afterwards more particularly as to the *medulla oblongata* being disordered in its circulation, by Dr. Handyside.

"IV. The fourth part of the essay is devoted to the practical deductions. These have been in a great degree already anticipated; and the necessity of drawing these observations to a close prevents us from dwelling on the subject.

"It is only in the case of operations on the neck, the upper part of the chest, the arm-pit, and the shoulder, that this accident is really to be dreaded. And it is more particularly immediately above and immediately below the collar-bone, in a circumscribed space, where the reflux of the blood or the venous pulse is observed, that it most usually happens. Particular circumstances, however, as the adhesion of a tu-

mour to a vein, rigidity of the surrounding parts, and similar causes, may extend the sphere of danger, so that incisions beyond the boundary specified may be followed by the introduction of air into the veins.

"Under all circumstances, the best rule that can be laid down as preventive consists in compressing the principal venous trunk, between the heart and the part on which the operation is to be performed.

"The application of this rule to particular cases constitutes the great difficulty in practice. In the case of venesection from the jugular vein, it is necessary to avoid opening that vessel low down, within reach of the reflux of the blood, and it is further requisite that the wound in the skin and that in the vein be quite parallel.

"M. Amussat expresses an apprehension that the dread of this accident may deter timid and cautious surgeons from attempting important operations in the neck and shoulder, or in the arm-pit. He sees reason also to blame the surgeons of small localities for excessive reserve, lest professional jealousy should take an opportunity of proclaiming any unsuccessful results. It cannot be denied that M. Amussat has good grounds both for the apprehension and the censure; and it too often happens that a rash and ignorant confidence will urge one man to undertake operations, which others more modest and timid, but better informed and better qualified, would have declined. The remedy for both is knowledge, and especially that knowledge recommended by M. Amussat, which is obtained by performing the operation, or, at least, imitating its performance on the lower animals several times, before it be attempted on the human subject. As to the extreme reserve deprecated by the author, and the cause to which he ascribes it, it is unfortunately a dark page in the history of surgeons, that too often any mishap is blazoned with the most benevolent zeal and assiduity,—sometimes with a reasonable amount of commiseration for the man who has been so unfortunate or so ill-advised, while every favourable case is allowed to pass in silence and obscurity. For this there is no remedy, except to recommend every one who censures, to consider what he would or could have done in similar circumstances; and if he be conscientious, he will be sparing in the language of censure or criticism.

"In a sort of supplementary note, M. Amussat adverts to sudden deaths after delivery, which may have proceeded from the admission of air into the veins. It is a known fact, that females have died immediately or soon after child-birth, in circumstances which rendered it impossible to ascribe the event to hæmorrhage, the most usual cause of death at that time. M. Chomel states in one of his lectures, that, in the course of six years, he knew that among four hundred and fifty individuals dead at La Charité, seven died in an unexpected manner,

while the most minute examination after death did not disclose any thing which could explain the sudden and fatal termination. In these cases, he conjectures that the cause might have been the admission of bells of air from the womb into the blood-vessels. Similar facts appear to have occurred in the practice of Baudelocque."

DOMESTIC.

A Phenomenon.—Our readers will remember, that during this summer, the strange renewal of the eye of our fellow citizen, Captain George Davey, has been a subject of discussion in the newspapers. The statements which have been made are not in all particulars true. He has been appealed to, and gives the following statement, to be found in the letter of Mr. Handy. Captain Davey is one of our most respectable citizens, and the statement he has furnished of this extraordinary phenomenon may be implicitly relied on.

Dear Sir,—You may have noticed, in various papers, statements in relation to the *new eye* (as he calls it) of our worthy citizen Capt. George Davey. Capt. Davey has seen some of the statements and pronounces them to be inaccurate. He has given me the statement of the case, which I send you this day, and expresses a wish to have it published, that any errors in fact may be corrected; and that the exceeding singularity of the case may be made known. The case may give rise to valuable investigations of this delicate organ of the human system. Doubtless many will be the speculations pertaining to it. It is unnecessary to say here that Capt. Davey is a highly respectable, worthy, and intelligent man.

STATEMENT.

"In the year 1779—about the last of March, when I was about ten years and nine months old—an inflammation fell upon the eye-ball of my right eye and continued in a high degree for about six weeks, giving exceeding great pain during the whole time. At the expiration of six weeks, suppuration took place, and a discharge of corrupt pus. About the end of another six weeks, when the eye-ball was completely gone, and the socket sunken, my father discovered a *new eye*, resembling a bead or bird's eye. Strange as it may appear, the discovery was real; and the miniature eye grew until about the middle of July, when it attained its perfect size, and the vision was as clear and distinct as ever it had been, and so continued for eighteen months. At this time, however, I was taken with a second inflammation in *both eyes*, occasioned by bathing before I had entirely recovered from the small-pox. This produced a thick strong film over the *new eye* obstructing my visage in it for about fifty-eight years. For the last seven or eight years the film spoken of

has appeared to decrease, until I can now distinguish different shades imperfectly. I can even now see tolerably well through a telescope or microscope; but it is remarkable that no spectacles, out of the great numbers I have tried, have ever afforded me any assistance. I use occasionally a thick convex glass, but with little aid. I am now about seventy-two years of age."

This is, almost verbatim, the very language of Capt. Davey, and is sent to you for publication for the reasons assigned above. Capt. Davey informs me that many medical gentlemen have seen his eye, amongst others Professor Granville S. Pattison.

Respectfully yours,

LEVIN HANDY.

August 5, 1840.

Somerset (Md.) Herald.

FOREIGN.

On the Gastro-Catarrhal Fever of Peru. By ARCHIBALD SMITH, M. D.

[Concluded from page 500.]

Case 2.—A middle aged man, of active habits, a respectable station in life, and of European parentage or descent, on the second evening of Carnival, 1836, made a hearty supper on Chiloe ham, cheese, and eggs, &c., and next day, in sport, they threw upon him a bucket of water, and drenched him all over. This wetting was followed by slight febrile symptoms, and he took some simple laxative; to co-operate with which his wife administered not less than ten clysters, under the impression that his indisposition was owing to *empacho* in consequence of the Carnival supper.

Finding, however, all her endeavours unsuccessful, she called to her aid the family doctor, who, in *junta* afterwards assembled, related that, on his first visit, he found the patient with a strong fever; foul tongue; strong pulse; dry skin; much headach; catarrhal symptoms, and difficult respiration. As often as he coughed, he complained of a most acute pain in the head; and the breast on these occasions (to repeat the patient's own words) felt as if a knife were stuck into it.

The doctor, reflecting on the joint import of the symptoms enumerated, thought that the disease fully declared itself as one of an inflammatory nature, and, therefore, the barber was sent for to bleed the patient. Meanwhile, whey was allowed as a lenitive diluent drink. Thus free perspiration was induced, and all the morbid symptoms were quieted for a while. But next morning wandering pains were felt, at one time in the head, at another in the breast, &c., and therefore his physician again ordered him to be bled and to continue the whey. With this arrangement all the parties were contented to remain in a state of expectancy till next morning, conceiving it probable, that the fever

would take on the prevailing type of the season,—that is, declare itself a bilious remittent. The patient passed a very bad night, and on the morrow, being the fifth day of his indisposition, the dry skin and tongue, which attended the febrile increment, were preceded by chills and shivering, and the matter expectorated was observed to verge to a sanguineous tint. The family now got alarmed, and a medical friend was called in to meet the family doctor. By the consent of both these professional gentlemen a third venesection was practised; and the patient was put on a ptisan of chicken-water, (*agua de pollo*), mixed with equal parts of linseed tea, until the doctors should return at the evening visit, further to observe the changing aspect of the case.

At vespers, or after sunset, four medical men, of whom I was one, assembled in *junta*, when we found the patient in a state of diaphoresis, after having perspired pretty freely since the morning visit of the two physicians; and a small, figured, yellow-coloured stool was shown to the members of the *junta*. The urine was high coloured; pulse full and strong; tongue a dirty yellow; head pretty easy; no pain on full inspiration; cough much diminished from what it was shortly before; and the expectoration was free, of a watery and frothy appearance, with some thin mucus among it.

The act of respiration, though easy, was attended by a wheezing sound; and by approaching the ear to within a short distance of the chest, there was a distinctly audible gurgling sound, which conveyed the idea of its being emitted, not from the bronchiæ, but from the heart, which palpitated greatly. The whole epigastrium and right hypochondriac region were sensible to pressure, and tender, and the belly felt puffy and full. It would be tedious for the reader to follow the minute details of this gastro-catarrhal fever which terminated happily.

I may, however, remark, that a slight inflammation appeared on the throat, and suddenly passed, as by metastasis, from one side to the other. The head was so much affected during the exacerbations, that though relieved in the intermissions, it was feared lest the excessive tenderness and irritation shown in the brain during these high stages of fever, might be transformed into a state of formal phrenitis; and hence the *junta* felt it their duty to recommend that the patient should confess himself to his spiritual guide whilst his mind remained entire.

He used the foot-bath, and was once or twice bled from the ankle, by the advice of the *junta*; and, when the cerebral irritation was considerably lowered, a blister, to produce counter-irritation, was applied to the nape of the neck. The bowels were opened repeatedly and freely by appropriate purgatives, and as the stools, which were dark and copious, fermenting after a short time like yeast, were day after day pre-

sented, the good woman, wife to the sick, rejoiced to see her ideas concerning the *empacho* of her husband, now verified to her full conviction.

A spare, cooling, and diluent regimen, was observed throughout; the head was shaved, and evaporating lotions applied to it; and latterly, after the catarrhal symptoms disappeared, pure pine juice was allowed as an antibilious refrigerant. In short, on the ninth day of his illness, and fifth of the medical junta, this patient was declared convalescent, and his usual health was soon recovered.—*Edinburgh Medical and Surgical Journal*.

On the Nervous Fever of Peru. By ARCHIBALD SMITH, M. D.—Fevers which, in their origin, are attended with high vascular action may, in the course of a few days, assume an adynamic form, and come under the name of the low-nervous, *perniciosas*, or malignant fevers of the Limeno.

In this manner intermittents and remittents are seen to degenerate into the continuous and pernicious; and the unfavourable transition in these instances appears to be less under the influence of common, occasional than of particular constitutional causes. Happily, however, fevers of malignant character (of which I have witnessed more in spring than at other seasons) are comparatively rare on most parts of the coast of Peru, and must be considered as deviations from the more ordinary and milder appearances of the prevailing fevers of the country.

I will here offer a few illustrations of these pernicious fevers, as they are commonly called.

A robust young man, when affected with high fever of only one day's standing, requested the assistance of his medical adviser, who found the pulse strong, full, frequent, and rebounding, with a strong throbbing sensation at the temples; skin dry and very hot; tongue foul, with bright red edges; slight pain at epigastrium on pressure, and irritability at stomach, indicated by nausea or vomiting.

After one or two bleedings, and other ordinary means to mitigate the severity of the attack, in a few days it entirely changed its aspect. The pulse became low and excessively frequent, or small, fluttering, and too rapid to be easily counted; the patient became feeble and tremulous, while the skin continued hot and dry; the fever exhibited irregular exacerbations, rarely terminating in sweat; and headache, drowsiness, or some marked disorder in the head, showed itself more and more, as the disease advanced to its crisis, in the form of salutary sweats. With the help of neutral salts in the morning, and anodynes in the evening; farinaceous diet; and lastly, change of air, the patient ultimately recovered, after a tedious convalescence.

I have seen the bilious remittent after several days' continuance degenerate into the state of the *perniciosa* or malignant. Thus, in the lat-

ter end of October, a young gentleman of a stout appearance, and a native of Europe, was taken unwell in Lima with a fever, which soon declared itself a regular remittent. It was attended with tenderness at the epigastrium, furred tongue, headach (increased during the evening exacerbation,) belly loose, the stools being thin and frequent, at first green, and then of the colour of orange-red or yellow. The skin was dry and hot, the pulse strong and frequent, the urine scanty and high coloured, and the patient anxious in his mind.

Blood was twice drawn to the extent of about one pound at each time; he had several warm baths, emollient applications to the abdomen, laxative enemata, sinapisms to the feet when the head appeared much affected, and for food and drink he had arrow-root or thin rice-pap, alternated with whey. A consultation was called, and shaving and cupping the head, &c., determined upon. What particular remedies were afterwards used I cannot say. But after several days had elapsed, this young man became the subject of various medical consultations; and, finally, he sunk so low, that, with great debility and a small, quick pulse, his tongue appeared furred, and of a dirty, dark aspect; lips parched with sordes on the teeth; he had also deafness, and, during the night, stupor and incontinence of urine. He recovered under the influence of an effort of nature. The cupping, which had been early recommended in junta, was not carried into effect under the superintendence of the physician, who was left in special charge of this case. But nature did what the doctor omitted; for, when the case had become nearly hopeless, a burst of epistaxis spontaneously supervened, and rescued the patient from approaching death. This spontaneous emission from the nostrils removed cerebral congestion, restored consciousness, mental health, and the power of the will over the muscular motions of the body. Hence convalescence at once followed the natural crisis by epistaxis. And the event offered this important lesson, very worthy of being borne in mind by those attending cases of a similar kind, that, by timely interference and seasonable local depletion, the happy effort of nature might have been anticipated; and that, if cupping had been resorted to in an earlier stage of the disease, the patient's sufferings might have been shortened, and the imminent peril that threatened his existence easily averted.

In other cases of pernicious fever, the precursory symptoms of excitement may be exceedingly moderate, and the nervous type show itself without any well-marked synocha. Thus I have known a young woman feel as if chilled, "*resfriado*," and take pectoral orchates with a view to remove the catarrhal symptoms; and the physician who commonly attended her ordered her to be bled, but in very small quantity, under the suspicion of the existence of an obscure peripneumony. When called to visit

her I observed that the bowels were costive, and when acted upon by opening medicine, the matter voided was dark and of a highly offensive smell; the pulse was small and extremely frequent, hardly to be counted; the eyes were suffused and red; attention distracted, and the mind confused; the skin dry or partly humid, with partial and transient sweats; great irregularity in the distribution of nervous energy, as indicated by rapid and alternate increments and decrements of fever, and unequal heat of surface, without any apyrexia or interval of fever. With the further progress and termination of this case I am not acquainted; but enough is stated to characterize the type of the fever.

I was called to see a stout young man in Lima, when sinking under a continued fever of several weeks' duration. He was reduced to the deplorable state of lying with his eyes and mouth half open, teeth incrustated with dry sordes, the tongue dry, rough, and brownish; senses heavy and intellect dull, with language occasionally incoherent; the pulse one hundred and twenty, small and fluttering; the belly was costive; and the urine high coloured. Before I saw him in this condition he had been treated by stimulants, tonics, and cordials; but, by giving him two grains of calomel every four hours in the form of pill, before he had taken thirty grains, the gums became mildly affected, and in three days he was convalescent. As soon as the mouth was touched by the remedy, his bowels were freely evacuated by a dose of salts and senna, when the depositions carried off were as dark as ink, and intolerably foetid. After this the disease assumed quite a different aspect; profuse perspiration followed, the circulation became equalized, and the young man had a refreshing sleep, from which he awoke with a clear and collected mind. Henceforth he had a favourable convalescence, and recovered perfectly.

Fevers beginning with symptoms of high excitement, and ending in the depressing manner which I have briefly described, are frequently known to arise, on the sandy plains of the coast, from exposure to intense solar heat; and then the head is the part first complained of, and violent fever of a pernicious tendency ensues. I have known a young Indian thus attacked when bathing himself in a deep pool on a very hot day, with all except his head in the water. He came out from the bath with a violent headach; and immediately covered over his head with a poultice of wet mud, which, he said, was considered a good remedy in his native place. The fever appeared with high vascular excitement, for which he was bled, and the bleeding relieved without removing the headach. He resided a few miles out of town, and had not the advantage of regular medical assistance, though he had the good fortune of residing in the hospitable mansion of a charitable gentleman, who said he always

cured the poor Indians about him by active English remedies, as salts and blue pill, but that the rich Indian who went to Lima to be cured on the *spectative* plan commonly died. I saw this poor Indian afterwards in a state of convalescence, and he recovered slowly. When at the worst his skin was reported to have been hot and dry, the pulse extremely low, body quite tremulous, head ached continually, and the lower belly was tender on pressure, while the tongue looked perfectly clean.

I have witnessed the case of a praiseworthy ecclesiastic of Lima, who, though never accustomed to go out of town, had a painful inducement to visit Chorrillos, (three leagues from Lima,) when he heard that the curate, whose assistant he was, died at this watering-place. The weather being very sunny, and the air of the close conveyance in which he was seated being very hot, he, unaccustomed to exercise, felt the exertion of going and coming the three leagues too much for him. He was also distressed in mind for the death of his friend; and, it was said, he inhaled some deleterious exhalation from the dead body confined in a shut up apartment, which he opened and entered without any precaution or previous ventilation. These causes conjointly were assigned for the fever, which appeared in its origin with symptoms of synocha, but terminated in a rapid failure of vital power, proving fatal on the fifth day.

I was only called to see him on the last day of his malady, when I found his pulse frequent, fluttering, and yielding, or retiring under the gentlest pressure of the finger; the tongue perfectly white, which he showed when desired, though he did not speak; and he appeared to be, when left undisturbed, in a somewhat lethargic state. In this drowsy and sunk condition, his attendants said he had only been since the day before. A stool was exhibited, which consisted of hard fæces, like hazel-nuts or filberts in size and colour. No opening medicine, except the customary clysters, had been administered. From the commencement of the attack, he had headach and tenderness at the epigastrium. He was twice bled in the early part of his sufferings; but his head was not shaved; he had a succession of sheep or pig cawls applied as an emollient to the abdomen; he drank cooling ptisans and "frescos con nieve," or refrigerating beverages with ice, which were not suspended till the fourth day of the disease, viz. on the day preceding its fatal termination.

With regard to the treatment adopted by a native practitioner in this case, I may be allowed to express my disapprobation, and observe that, if, after the first or even second general bleeding, (though in fevers of adynamic tendency depletion should be used with great circumspection,) the bowels had been opened freely,—the head shaved and kept cool by proper lotions; or, in the event of this not

proving sufficient to relieve the head, had cupping-glasses been applied to the nape of the neck, and a good blister to the epigastrium, such means would at least have afforded the patient a better chance of recovering than what fell to his lot.

The use of iced-drinks in this fatal case was not appropriate practice under the actual circumstances; for from the tenderness at the epigastrium it may be supposed that the stomach was not free from acute inflammation; and there was ocular evidence from the appearance of the alvine discharges, that the condition of the bowels had not received proper attention. If iced-drinks could have been at all admissible in such a case, they could only be so, as in other instances of daily occurrence in which they are had recourse to, after the bowels had been suitably prepared for them by clearing out their irritating contents. There appears no good reason for having omitted the shaving of the head of this ecclesiastic; but it may be observed, that to this practice the inhabitants of Lima are very averse. In a case of repeated consultation, in which it was deemed necessary for a young woman's safety to apply a blister to the occiput, I have known some native physicians so sympathizing and sensitive, as only to allow the barber to expose a surface about the circumference of a dollar, or little more than what every friar shaves on the vertex or crown of his head. But, however scrupulous native practitioners are in dispoiling the Limenas of that natural ornament which they all prize so much, as never to crop from their childhood upwards, yet life is surely of more value than the handsomest tresses of the female patient.

It is an important feature in the pernicious fevers of Lima, that whether the affection of the head be primary, or, as more usually happens, secondary, or apparently coeval with gastric disorder, we are seldom called to any case of this nature, especially when of some days' duration, in which we do not find a morbid degree of irritability of the stomach, demanding the utmost attention, both as respects diet and medicine. For the rapid sinking of the general strength, or vital powers, may be in these cases, observed to be connected with a morbid condition of the gastric organs.

It should further be remembered, that the convalescent from one of those attacks requires so nice an adaptation of the nutriment he takes, to the impaired strength of the digestive powers, that he may become delirious at night by the indigestion of a soup, somewhat too rich or gelatinous, taken in the middle of the day; and relapses often occur when all danger is thought to be over, because the attendants are only solicitous to re-establish by generous diet the strength of the patient. In consequence of a sudden transition from farinaceous and low diet, to eating the breast or wing of a chicken,

or any sort of animal food, patients from being convalescent are seen to fall into a state of stupor, from which they are perhaps so fortunate as to be roused again by the operation of an effective purgative, followed by a blister placed on the region of the stomach. And in some such cases, I have known the healthy functions of the brain recovered at the expense of a general bleeding; which, however, can rarely be so eligible as local depletion in such instances, as it will be commonly found, that the persons affected have already been much debilitated by previous venesection and protracted disease.

From topical emission of blood at the occiput or nape of the neck, I have had the pleasure to witness the most beneficial effects, when *tercianas de cabeza*, formerly alluded to, or more or less perfectly developed intermittents with a particular determination of blood to the head, hurried on to assume what may be called a typhoid or low nervous type.

Camphor, musk, and all such remedies, though frequently used in native practice, I have never known to do good when tried in the pernicious or malignant fevers of the country; on the contrary, they do harm; and in almost every case wherein I have known them to be administered, gum-water, the alleged specific for gastro-enteritis, would be a far better remedy. I once attended in consultation, a young man, in whom a common *terciana*, to the best of my recollection, had degenerated into a fever of a low nervous aspect, which the consultation was called in to remove. The fever never left the youth, whose bowels were costive, skin dry, mouth parched, and pulse low, but much accelerated; his spirits were dejected, and petechiæ appeared to a considerable extent on his body. Here the treatment adopted was to give the infusion of Peruvian bark, with a small quantity of sulphate of magnesia several times in the course of the day, and by this means the bowels were kept open without causing any such excessive evacuations as could further debilitate the weakly patient. Cold water, with the juice of the pineapple or some other cooling fruit added to it, was drank after each dose of the bark in particular; and generally, or at any time, he was permitted to partake of the same grateful drink when he had urgent thirst; always recollecting this exception, that, if there should be any diaphoresis, or indications of more free perspiration, cold drink was absolutely forbid. His aliment consisted of pap, made from rice and bread, seasoned with a vegetable acid. Under such treatment the young man recovered.

Fevers of adynamic termination are sometimes accompanied with parotid swellings; but not frequently, so far as I had an opportunity of witnessing.

In consultation, I have seen one memorable instance where, at the close of the fatal disease, the symptoms were those of a genuine *typhus*

gravior. The case alluded to was that of an accomplished and fashionable young lady,* whose death was deeply lamented among those of her own high rank in society.

But it is to be observed, that though such aggravated cases of what might be called sporadic typhus are now and then known to occur in Lima, and in the warm valleys adjacent, or along other parts of the Peruvian coast, yet, we never find that these malignant fevers spread from house to house, or from individual to individual. Never are physicians or attendants on the sick affected with it from immediate contact with those who suffer from it; and the stranger who first witnesses a case of this sort in Peru, after having been familiar with typhus in Europe, is apt to conceive that danger is to be apprehended from contagion, and he directs his measures accordingly. But the native practitioner laughs at his imaginary fears, and assures him his ideas are erroneous, and that experience will satisfy him that the pernicious or malignant fever of their happy clime is never contagious.

To this statement, however, there remains to be mentioned a singular exception.

Dr. J. M. Valdes of Lima, in a pamphlet on the Epidemic which prevailed in his native city during the siege it underwent in the year 1821, states at page 23, where he treats of the continued bilious fevers that had degenerated into putrid or malignant,—that is, fevers in which there was observed a sudden prostration of strength without manifest cause,—that this fever was contagious in the hospitals, and in the houses where many sick were assembled together. And at page 27 of the same valuable treatise, he remarks, that the exciting causes of this epidemic were assuredly consequences of the war, which deprived the inhabitants of the salutary use of ice, good bread, and wholesome food, and which kept their minds in terror for the loss of property and life. This is the only notice that, during my residence in Peru, I had of the contagious power of the putrid, or what is usually called the pernicious or malignant fever on the coast. And supposing the doctor quite correct in his observation of the fact, as stated by him, it is obvious that the anomaly is one peculiar to those revolutionary times and circumstances, and not a fact of ordinary occurrence in the practice of the Limese physician, who, as I have mentioned, laughs at the very idea of contagion.

Ibid.

On the Exanthemata of Peru. By ALEXANDER SMITH, M. D.

Among the cutaneous diseases prevalent in Lima, may be enumerated, first, the principal febrile eruptions; and in the second place, various exanthematous affections unaccompanied with fever.

* Miss Taramona.

A. Febrile Eruptions.—1. Miliary eruptions, vulgarly called *sarpullidos*; neither infectious nor always attended with fever;* 2. Variola; 3. Varicella; 4. Rubeola; 5. Roseola; 6. Acute Erythema, unusually symptomatic of gastric disorder; 7. Scarlatina; 8. Urticaria; 9. Purpura; 10. Erysipelas; 11. Furuncular tumours called *chupones*, frequently attended with smart fever, and most acutely painful; 12. Anthrax, or carbuncle, which appears in the loins, back, or nape of the neck, and is prevalent among the bronzed and negro classes; 13. *Grano de peste*, or a malignant furunculous pustule, which usually appears on the arms and face.

On the above catalogue of cutaneous affections, it would be superfluous to comment in detail; but a few observations may be offered on some of the diseases enumerated.

1. *Variola*. This disease, so fatal in some other parts of Peru, is in Lima a comparatively mild disorder. Indeed, vaccination has become so general in the capital, that there, at least, through the diligence of Dr. Figueroa, the small-pox is nearly exterminated. In private practice I have only seen one or two cases of the disease; and Dr. Herrera, Physician to the Hospital de Incurables, where patients affected with small-pox are usually sent, informed me in October, 1835, that during two years he had then been in charge of the hospital, he had only lost one patient of "*Viruela*," or variola, and mentioned that this disease scarcely ever appeared in a malignant form among them. They are chiefly slaves from the estates surrounding the capital, who are in the present day received into the Hospital de Incurables; not, however, as incurable, as the name of this institution would imply, but to be cured, and that at the easiest and cheapest rate.

2. *Rubeola*. This is an exceedingly prevalent but mild disease, which occurs at all seasons.

In the same family the eight following cases presented themselves to my observation in the spring of 1835, when measles prevailed in town; and as they show how the disease, if allowed to have been of the same nature in all those instances, may be modified in individual constitutions, and persons of different race or cast, when exposed to the same source of contagion, I shall notice them separately.

a. A boy of Spanish descent, and about 9 years of age, was the first of the family affected. On him the eruption was general; the fever very moderate, and there were no catarrhal symptoms.

b. A young gentleman, (brother to the above) 14 years of age, was affected with mild *cynanche tonsillaris*, but no efflorescence appeared on the skin.

c. A Mestiza girl, 10 years of age, was affected with a sense of oppression at the scro-

* Under the term "*Sarpullidos*" may be included the Lichen Tropicus, or prickly heat.

biculus cordis, and moderate fever (during which she vomited a "lombriz," or long round worm,) which preceded the cutaneous eruption. This patient had slight sore throat, which, on inspection, presented a red and irritated appearance, but without tumefaction.

d. A Negrita, or negress, 12 years old, was affected, in like manner, with the Mestiza, excepting the accident of the lombriz.

e. A Cholito, or little Indian boy, had a mild fever and light eruption, with a slight uneasiness at the throat, accompanied with unusual redness of the fauces.

f. The coachman, a Zambo lad, had a very copious and general eruption, and a strong precursory fever, aggravated probably by having persisted, for the first days of his illness, in taking hot mirasol, or red agi-pepper, in his soup.

g. A young Zamba girl, 11 or 12 years of age, suffered a very mild attack, and had but a slight eruption. She, like the coachman, never complained of sore throat. It is to be observed, that two or three days before this girl's febrile disorder appeared, her bowels had been acted upon pretty freely by clysters,—a circumstance which probably conduced to the mildness of the measles which followed.

h. A Zamba, about 17 or 18 years of age, was the last person in the family affected with this disease, and in her case the fever ran high, attended with oppressed breathing and catarrhal symptoms. She had a perfectly formed cynanche tonsillaris, and with it a profuse eruption on the skin; and as the eruption retired and the throat recovered, she was seized with cynanche parotidæa, but she soon got quite well.

This girl, some years before, had suffered from hæmoptysis, and was suspected of being in a state of confirmed decline; but long before this attack of measles, she had been considered quite free of all these old complaints.

In the above eight cases, which occurred, as mentioned, in the same family or household, the precursory fever varied from three to six days; and the shortest fever was in the case of the youngest, or the first of those attacked as described. All the cases occurred in the course of about twenty-eight days, the one patient recovering as another fell ill; and, occasionally, several of these individuals were confined together in the same apartment at the same time.

3. *Roseola*. This affection I would include in those transitory efflorescences indiscriminately called "*brotos*," and which are ushered in by some restlessness and acceleration of the pulse. The general denomination *brote*, or rash, is applied to those varieties of cutaneous appearances so common in infancy and childhood, for which the natives have as yet adopted no specific names. By dieting or changing the nurse, by open bowels, general cleanliness, and daily bathing, these affections are commonly rendered harmless; and little profes-

sional curiosity or interest is displayed in the ordinary management of such exanthemata.

4. *Scarlatina*. This disease is happily not so frequent as rubeola, yet it is well known in Lima,—principally in the form of *scarlatina simplex*, or *anginosa*.

In the year 1832, I was called in consultation (not many hours before the patient died,) to assist a Chilian gentleman affected with a very malignant case of angina, or ulcerated sore throat, which was made the subject of proto-medical inquiry at the time. A few days after his arrival in Lima, he died of this malignant sore throat, the seeds of which he must have carried with him from his native country; for he was heard to say that he had come away from home, "*huyendo del peste*," or flying from the plague of a scarlet fever that then raged in Chili.

In this case there was no distinct exanthematous affection of the skin; but we may be allowed to infer that the inflammation of the throat and mucous linings of the first passages was so concentrated as to have prevented the appearance of an external efflorescence or eruption, which would probably have appeared had not the patient been early destroyed by gangrene. That this fatal case was essentially of the nature of the Chili epidemic, or scarlatina, is verified by the fact that a military friend who visited him in his last illness, as well as his nurse, were immediately after seized with scarlet fever in a mild form; but precautions were now taken, and the contagion was not allowed to spread.

I am of opinion, that if yellow fever (unknown on the shores of Peru,) were ever to be imported as the scarlatina had been, it would not propagate itself by contagion, provided the public precaution were taken to place the sick at a distance from one another, and in well ventilated situations, so as not to form a focus of infection, as happens in confined situations, such as ships and prisons. And further, by being conveyed one day's journey from the coast to the inland country, the infected could be at once (even in the most sultry months of summer) transported into sufficiently elevated localities, where the change of air and climate should infallibly annihilate the contagious power of this very formidable malady, so familiar to the inhabitants of some parts of the eastern shores of Spanish America.

But to return from this digression, I may here remark that there is a form of angina, which appears to be in some degree akin to scarlatina, unaccompanied with any cutaneous eruption, and of frequent occurrence in Lima. It is sometimes preceded by rigors and fever, at other times the alteration in the pulse is very little, but there is a soreness in the throat at the time of swallowing. The tonsils appear very little, if at all, swollen or elevated, though they may be slightly and superficially ulcerat-

ed, or have an aphthous, and grayish or whitish aspect.*

This affection of the throat I have seen various persons, chiefly adults, affected with, at or about the same time: but I could not ascertain that it ever was contagious, though I have seen it occur when scarlatina was known to be in the city.

In several instances, I met with this kind of angina, accompanied with a low nervous fever, and great prostration of strength. Where the affection of the throat was slight, opening medicine and cooling tamarind drinks were sufficient for the cure. In severer cases I was accustomed to prescribe, with satisfactory effects, an emetic of ipecacuanha, and afterwards administer the infusion of bark, with a small quantity of a neutral salt, just enough to keep the bowels easy, without producing debilitating evacuations.

I have known a young lady in Lima affected with a malignant sore throat, without any cutaneous eruption, whose ailment (considered to be a variety of scarlatina) was greatly aggravated by the musk and hot regimen prescribed her, by some young medical gentleman, who earnestly resorted to the application of stimulants, as they saw her strength sink under an adynamic fever. I was called to see this person, and suggested the propriety of leaving off the stimulating plan of cure. The consequence was, that a dose of sulphate of magnesia to relieve the bowels, followed by the bark infusion, restored her readily to health, after her situation had excited great concern.

5. *Purpura*. It may be noticed generally, that the purpura simplex, or small petechial like flea-bites, the *Porphyra pulicosa* of Dr. Good, is a very common appearance in Lima, especially among women and children, in chronic febrile diseases, when those affected happen to be laid up in ill-ventilated apartments, or residing in narrow lanes on the banks of the Rimac, or in the sultry, confined apartments attached to little retail shops in nearly all the principal commercial streets of the city.

But the *purpura hæmorrhagica* is seen on the coast to affect, with remarkable frequency, Indians of either sex, recently arrived from the interior of the country; though the disease is by no means confined exclusively to such persons.

Boys newly got from the inland valleys, who have lived chiefly on fruit and vegetables, and are in the capital intended to be brought up to serve at the tables of the wealthy, where they eat animal food, and live on a more generous diet than they have been accustomed to

* The aphthous sore throat of young children is a very common affection, as may be easily conceived, since the alimentary organs are very commonly disordered. To remove this affection, the natives use various acidulated syrups, all of them quite inferior in their effects, as local applications, to the common mixture of borax with honey.

from their childhood, are those in whom I have witnessed the worst examples of the purpura hæmorrhagica. The affection in those instances came on without any premonitory symptoms of illness, while the boys were to all appearance, but a day before the attack, perfectly well.

This disease, when it occurs in the form of a continued oozing from swollen gums, with small frequent pulse, and an appearance of dark blood in the stools, together with innumerable small livid spots on the skin, may be cured readily by a mild efficient purgative, such as an infusion of senna and rhubarb, with the addition of a neutral salt, followed up by small doses of sulphate of quinine dissolved in water sharpened with sulphuric acid. But in other instances, the hæmorrhage from the nose and mouth, &c., is so active, and kept up by such strong vascular action, indicated by a full, hard, and frequent pulse, that it can only be subdued (and that not unoften but for a short time) by the use of the lancet; after which, purgatives and acidulated drinks may be of efficacy.

6. *Grano de Peste*. The following account, which I think well calculated to convey a correct idea of this disease, was verbally given me, in March, 1836, by a respectable woman in the part of the suburbs called *Malambo*, only a few days after she had recovered from an attack which she described in the following terms: "It began on the left arm, like a mosquito bite, being merely a small red speck, with a sort of a minute vesicle in the centre. It went on rapidly increasing with intense fever; and in four days the whole arm had swollen so as to appear ready to burst, and the swelling reached the left breast. The spot, which at first looked only like a mosquito bite, now became a hard grain or boil, entirely black, and surrounded with a red and indurated base. The little vesicle in the centre, opened a small mouth, or orifice, through which there was no discharge. At the end of eight days, an incision was made into the grain, but nothing escaped from it, except a thin ichorous discharge, or 'aguadija.' The grain attained at last the size of a black grape, but it was flat at the top, (*chato*) and of a hard consistence until opened. It was cured by emollient fomentations, and two bleedings ordered by the doctor."

We are to understand, as a matter of course, and therefore taken for granted in this woman's description of her own case, that occasional enemata and acidulated refrigerant drinks were here used according to custom, and at no time lost sight of during the progress of the disease or treatment. I may further remark, that, in its commencement, the *Grano de Peste*, which is not contagious, is usually attended with fever of inflammatory character, and, if not well managed from the beginning, it soon degenerates into an adynamic form, very often

ending in death. Hence the practical importance of checking, in proper time, by venesection, that high excitement, and strong vascular action, with which the disease commences in young and robust subjects, and which naturally leads, if not controlled by art, to a succeeding state of prostration of strength and exhaustion of vital power.

B. Exanthematous Affections unaccompanied with Fever.—Of the Exanthemata unattended with fever, and of common occurrence in Lima, but of which I have preserved no written descriptions, I will here enumerate such as clearly present themselves to my recollection, without desiring to have it imagined, that the enumeration, though correct as far as it goes, is by any means a complete list of such cutaneous affections.

1. *Ecchymomatous discolorations.* These are called "cardinales," by the natives, and appear in the form of black, blue, and livid marks, which are of longer or shorter continuance, arising spontaneously, and, especially in fair-skinned females, and feeble children, without external bruise or injury. After ague-fits, dark marks of this kind are sometimes observed round the eyes; but these extravasations quickly disappear without medical interference.

2. *Pityriasis versicolor.* This discoloration not unfrequently occurs among persons of white and delicate skin, particularly Europeans, in whom I have seen it appear in brownish yellow patches about the neck or abdomen. I have known it disappear by removal to a cool climate.

3. *Leucopathia.* This is a disease which may be observed in negroes, mulattoes, and other dark races, in whom the skin, especially about the face and hands, undergoes a partial change from its natural dusky colour to white, presenting a curious spotted appearance.

4. *Jaundiced yellowness of eyes and skin.* We often see this appearance as symptomatic of chronic liver disease.

6. *Prurigo* is a common disorder in warm weather. There is sometimes complained of, a local pruritus of the genitals, which is intensely annoying and difficult of cure.

8. *Caspa.* This is the native name for slight furfuraceous affections, or desquamations of the skin, very common among the inhabitants of the coast. Sea-bathing is held to be a good remedy for mild attacks of this disorder; but sometimes these may be of syphilitic origin, and therefore require to be considered carefully, and treated judiciously, as circumstances may suggest. I may mention that those affected with syphilitic eruptions are usually very sober in their habits; for even women of the town in Lima, are strangers to the common English vice of inebriety.

9. *Psoriasis.* This disease is not an unfrequent one; more particularly that variety of it called *P. palmaris*.

10. *Lepra* and *Ichthyosis* are both frequent

and inveterate affections among the dusky and slave population.

11. *Ringworm (Impetigo figurata)* is a frequent and troublesome affection, which seems very generally to depend on constitutional causes; but when not old and unusually inveterate, it commonly yields to cleanliness, well regulated bowels, and the local application of the mild citron ointment.

12. *Scabies or Itch.* This disorder is divided by the vulgar into two sorts; the one, in which the pustules are larger, they call "Carracha Sierrana," or the itch of the interior or hill-land; and the other, which is the commonest variety on the coast, they call "carracha fina," in Lima—in consideration, we suppose, of the smaller sized pustules in this infectious disorder, which they attempt to cure by baths and general bleedings, &c., having a great prejudice against sulphur, which is the well known and most certain remedy.

14. *Pasas or Favi.* The infectious disease to which the Limenos apply the first of these names, consists of soft and painful excrescences, appearing between the nates, or on the piliform parts in the vicinity of the anus. Such of these excrescences as I have had opportunity to see, were of the size of dried grapes, as the appropriate term *pasas*, which means raisins, at once suggests; and like raisins, they are flattened on the surface. They have also irregular edges, and emit some discharge. The local remedy consists in the application of a proper escharotic, as the sulph. cupri, or blue stone, followed by a bread poultice, rest, and cleanliness. Constitutional treatment I have not known them require; though it will always be convenient, should it only be from the usual locality of the disease, that the bowels be kept quite open and easy.

15. *Lupus.* I have seen two instances of a lupus or corroding ulcer on the forehead. Both cases occurred in females; the one middle-aged, and the other far in the decline of life. The former example, which was somewhat more superficial than the latter, healed under the use of aperients and the local application of the citrine ointment, well diluted; the latter appeared to be incurable; for arsenical and other remedies, usually recommended in books, were resorted to without any improvement in the appearance of the sore, which was a deep ulcer, gnawing, and destroying the common integuments and fascia on the forehead, and between the brows. Affections of this kind are not rare, as I am credibly informed, in different parts of the interior, where they are known under the name of "uta;" a word used by the natives to denote an insect, which they suppose to be the cause of the lupous ulcer, to which they therefore transfer the name of the insect.

16. *Elephantiasis.* This term is confined in Peru to a large tumefaction in the leg, which becomes overgrown, clumsy, and through time

quite rough on the surface. As far as I have seen, it only affects the negroes, or other dusky persons of African descent. I do not recollect to have seen more than one instance of it in the warm valleys of the interior, and it is possible that this case may have originated on the coast. I witnessed a recent case of it in a young Zambo, who was brought from the vale of Caneti to the house of his master in Lima. When on the sugar estate in Caneti, he was employed as *rigador*, or in irrigating the plantations; and he referred the origin of his swelled leg to his being so much employed in the wet, which few negroes are fond of. He was now made to change his occupation, and to pass from the wet labour of the field to the dry service of the kitchen; and when I last saw him, his leg, though of a large size, had not yet acquired the usual asperity of surface characteristic of elephantiasis in its perfect state. I would be disposed to believe that the tormenting insects named piques, or chigres, which abound to excess in the slave-barracks or galpon, on the coast, and are known to commit extensive ravages in the feet and toes of the slaves, contribute not a little to induce the great thickening and roughness of the integuments, observable in the elephantiasis of that country.

I should also mention that the Guinea-worm is said to appear occasionally, emerging from under the cutaneous tissues of the agricultural slaves on the coast; but, as I never witnessed a case of this nature, I can say nothing on the subject from personal observation.

Ibid.

On the Simple Gastric Fever of Peru. By A. SMITH, M. D.—There is a mild kind of fever which seems to be immediately connected with a morbid condition of the mucous membrane of the digestive passages, and receives the name of gastric fever. It is so frequently met with during the bathing season or summer months in Lima, as to deserve a word in passing.

It is marked by anorexia or disrelish for food; a perfectly white and smooth tongue; some thirst, and a desire for cooling drinks; moderate acceleration of pulse without distinct intermission of fever; almost incessant perspiration, which is eminently favoured by the warmth of the weather. The patient is not so ill as to be confined to bed, but feels listless, and likes the ease of the hammoc or sofa; and usually refers the origin of the ailment to cold, caught probably in the bath, or to cold and some irregularity of diet conjoined, as the result of late evening parties.

This gentle fever the women often manage without the assistance of the faculty, by the administration of the mildest injections;—a light farinaceous diet with vegetable acids, and frescos or cold drinks, from which they are not at all cautious to take the chill, though by this neglect they are apt to check a salutary perspiration, and thereby increase the disorder.—*Ib.*

Some Observations on the Mode of Union of Fractured Bones. By R. H. MEADE, ESQ., Lecturer at the Middlesex Hospital.—This paper, which is one of a series upon the subject, intended by the author to be brought before the society, contains the details of several experiments conducted on rabbits and guinea-pigs, with a view of determining the precise mode of union in fractures of the flat bones, the scapula being here selected for the purpose as the most easily fractured. The animals chosen were of different ages, that it might be ascertained whether age exerted any material influence on the reparative process, and care was taken to inflict as little injury as possible on the soft parts. Preparations and drawings of the parts were exhibited, in illustration of the narrative. From these experiments, (nine in number,) and many others of a similar kind performed on the scapula, the author infers that union is accomplished in the thick part of the scapula exactly, as it is in the cylindrical bones, viz., blood is effused into the different tissues surrounding the fractured part; that this blood is next absorbed, and coagulated lymph deposited in the substances of the muscles, and in the neighboring cellular tissue, so as to form them into a solid gelatinous mass. The periosteum which has been ruptured, is separated from the fractured edges, inflamed and thickened, and lymph is effused between the fragments themselves. At a later period, the external mass decreases in size, the muscles return to their natural texture, and a firm layer of cartilaginous matter surrounds the fractured spot, with which the periosteum is so completely blended, that it is difficult to say whether it is external to, or beneath it. This callus adheres firmly to the surfaces of the bones, and dips down between the fragments. Ossification then takes place, by the deposition of earthy particles in the cartilaginous matter, which particles are deposited irregularly through all parts of the provisional callus at the same time, and do not appear first at that part which is next to the surface of the bone.

The process of union of fractures in the flat part of the scapula differs somewhat from the process here described. In speaking of the part which the periosteum plays in the production of the callus, the author observes, that where two fractured portions of a flat bone overlap each other, and the edges which are in contact are denuded of their periosteum, union takes place between the opposed surfaces through the medium of fibro-cartilaginous substance becoming osseous, which possesses all the characters of the common external or provisional callus. This matter must here arise from the surfaces of the bone itself; and this fact shows that the provisional callus may be generated independently of the periosteum.—*Trans. of the Royal Medical and Chirurgical Society.*

Lon. Med. Gaz.